

### **REMARKS**

In a non-Final Office Action dated February 9, 2009 ("Office Action"), the Examiner rejected claims 1, 3-8, and 11-14 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,005,939 to Arvanitakis et al. ("*Arvanitakis*") in view of a non-patent literature reference titled "Optical Networks: A Practical Perspective, 2<sup>nd</sup> ed." to Ramaswami et al. ("*Ramaswami*"), U.S. Patent No. 5,565,675 to Phillips ("*Phillips*"), U.S. Patent No. 5,696,657 to Nourrcier, Jr. et al. ("*Nourrcier*"), U.S. Patent No. 7,136,594 to Nakanishi et al. ("*Nakanishi*"), U.S. Patent No. 5,039,194 to Block et al. ("*Block*"), and U.S. Patent Publication No. 2002/0140081 to Chou et al. ("*Chou*"), and rejected claims 2 and 10 under 35 U.S.C. § 103(a) as being unpatentable over *Arvanitakis* in view of *Ramaswami*, *Nourrcier*, *Nakanishi*, *Block*, and *Chou* in further view of U.S. Patent No. 5,097,393 to Nelson et al. ("*Nelson*").

In response to the Office Action, Applicants have amended claims 1, 4, 6, 7, 8, 11, 13, and 14. These amendments are fully supported by the specification and add no new matter. Applicants respectfully traverse the remaining rejections and requests reconsideration based on the following remarks.<sup>1</sup>

#### **Claim Rejections Under 35 U.S.C. § 103(a)**

Applicant respectfully traverses the rejection of claims 1-8 and 10-14 under 35 U.S.C. §103(a) because a *prima facie* case of obviousness has not been established with respect to these claims. Although Applicant respectfully disagrees with the basis for the Examiner's rejections, in the interest of expediting allowance of the pending claims, Applicant has amended claims 1, 4,

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<sup>1</sup> The Office Action contains statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicants decline to automatically subscribe to any statement or characterization in the Office Action.

6, 7, 8, 11, 13, and 14, and, for the reasons set forth below, submits that the amended claims even more clearly distinguish the claims from the cited references.

Claims 1, 3-8, and 11-14

Claims 1, 3-8, and 11-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Arvanitakis* in view of *Ramaswami*, *Phillips*, *Nourrcier*, *Nakanishi*, *Block*, and *Chou*.

Amended independent claim 1 recites a transceiver system that includes, *inter alia*:

“...a transmitter portion arranged on a contiguous bottom layer of a multi-layer printed circuit board, the transmitter portion capable of providing signals to a transmitter optical subassembly configured to transmit optical signals from the transceiver system; [and]

a receiver portion arranged on the contiguous bottom layer of the multi-layer printed circuit board, the receiver portion capable of receiving signals from a receiver optical subassembly configured to receive optical signals into the transceiver system...”

*Emphasis added.*

Applicants respectfully submit that *Arvanitakis*, *Ramaswami*, *Phillips*, *Nourrcier*, *Nakanishi*, *Block*, and *Chou*, whether viewed separately or in combination, fail to disclose or suggest at least these claimed features.

*Arvanitakis* generally discloses an “optoelectronic assembly 10 ... capable of providing bidirectional data transmission between [a] fiber optic means 11 and an electrical circuit member 13.” *Arvanitakis*, Col. 3: ll. 26-30. *Arvanitakis*’ optoelectronic assembly includes two separate discrete circuitized sections 61 and 63 mounted on a substrate 27, which in turn is mounted on a printed circuit board 15. *See e.g., id* at Figure 2, Col. 3: ll. 26-48, and Col. 4: ll. 52-60. A transmitter optoelectronic device 31 is positioned on circuitized section 61 and a receiver optoelectronic device 33 is positioned on circuitized section 63. *Id.* at Col. 4: ll. 5-19 and Col. 5: ll. 51-57. In addition, *Arvanitakis* discloses that “the invention ... further includes a radio

frequency (RF) shield member 103 ... between circuitized section 61 and 63.” *Arvanitakis*, Col. 7: ll. 40-43. Accordingly, as is illustrated in detail in Figure 6 of *Arvanitakis*, circuitized sections 61 and 63 are discrete and separate circuit layers divided by RF shield 103.

Nowhere, however, does *Arvanitakis* disclose or suggest “a transmitter portion arranged on a contiguous bottom layer of a multi-layer printed circuit board .. [and] a receiver portion arranged on the contiguous bottom layer of the multi-layer printed circuit board,” as recited in claim 1. *Emphasis added.* Rather, the transmitter/receiver optoelectronic devices 31 and 33 of *Arvanitakis* are respectively arranged on two different discrete circuitized sections 61 and 63 separated by RF shield member 103. *See e.g., id.* at Figure 6. Accordingly, *Arvanitakis* fails to disclose, or even suggest, a “transmitter portion” and a “receiver portion” arranged on a “contiguous bottom layer,” as recited in claim 1. In fact, Applicants respectfully submit that *Arvanitakis*’ limited disclosure of discrete circuitized sections separated by an RF shield member as shown, for example, in Figure 6, implicitly teaches away from arranging a “transmitter portion” and a “receiver portion” on the same “contiguous bottom layer,” as recited in claim 1.

*Ramaswami* fails to cure at least the aforementioned deficiencies of *Arvanitakis*. *Ramaswami* generally discloses several types of photodetectors configured to generate “electrical current proportional to the ... optical power [incident on the photodetector].” *Ramaswami*, p. 192: ll. 1-4. As noted by the Examiner, *Ramaswami* further discloses the use of an avalanche photodiode as a photodetector. *Id.* at p. 197: ll. 6-13. Nowhere, however, does *Ramaswami* disclose or suggest “a transmitter portion arranged on a contiguous bottom layer of a multi-layer printed circuit board, the transmitter portion capable of providing signals to a transmitter optical subassembly configured to transmit optical signals from the transceiver system; [and] a receiver portion arranged on the contiguous bottom layer of the multi-layer printed circuit board, the

receiver portion capable of receiving signals from a receiver optical subassembly configured to receive optical signals into the transceiver system,” as recited in claim 1. Accordingly, *Ramaswami* fails to cure the deficiencies of *Arvanitakis*.

*Phillips* fails to cure at least the aforementioned deficiencies of *Arvanitakis* and *Ramaswami*. *Phillips* generally discloses “an optical receiver assembly” that includes a “hybrid detector package 17, a printed wiring board 13, and an integral mechanical receiver mount 15.” *Phillips*, Col. 2: ll. 35-36. Nowhere, however, does *Phillips* disclose or suggest “a transmitter portion arranged on a contiguous bottom layer of a multi-layer printed circuit board, the transmitter portion capable of providing signals to a transmitter optical subassembly configured to transmit optical signals from the transceiver system; [and] a receiver portion arranged on the contiguous bottom layer of the multi-layer printed circuit board, the receiver portion capable of receiving signals from a receiver optical subassembly configured to receive optical signals into the transceiver system,” as recited in claim 1. Accordingly, *Phillips* fails to cure the deficiencies of *Arvanitakis* and *Ramaswami*.

*Nourrcier* fails to cure at least the aforementioned deficiencies of *Arvanitakis*, *Ramaswami*, and *Phillips*. *Nourrcier* generally discloses “detector bias and transimpedance amplifier circuitry useful with APD laser range finder receivers.” *Nourrcier*, Col. 1: ll. 8-11. Nowhere, however, does *Nourrcier* disclose or suggest “a transmitter portion arranged on a contiguous bottom layer of a multi-layer printed circuit board, the transmitter portion capable of providing signals to a transmitter optical subassembly configured to transmit optical signals from the transceiver system; [and] a receiver portion arranged on the contiguous bottom layer of the multi-layer printed circuit board, the receiver portion capable of receiving signals from a receiver optical subassembly configured to receive optical signals into the transceiver system,” as recited

in claim 1. Accordingly, *Nourrcier* fails to cure the deficiencies of *Arvanitakis*, *Ramaswami*, and *Phillips*.

*Nakanishi* fails to cure at least the aforementioned deficiencies of *Arvanitakis*, *Ramaswami*, *Phillips*, and *Nourrcier*. *Nakanishi* generally discloses a “downsized optical communication device ... having a short length, a small width and a thin thickness.” *Nakanishi*, Col. 3: ll. 56-60. Nowhere, however, does *Nakanishi* disclose or suggest “a transmitter portion arranged on a contiguous bottom layer of a multi-layer printed circuit board, the transmitter portion capable of providing signals to a transmitter optical subassembly configured to transmit optical signals from the transceiver system; [and] a receiver portion arranged on the contiguous bottom layer of the multi-layer printed circuit board, the receiver portion capable of receiving signals from a receiver optical subassembly configured to receive optical signals into the transceiver system,” as recited in claim 1. Accordingly, *Nakanishi* fails to cure the deficiencies of *Arvanitakis*, *Ramaswami*, *Phillips*, and *Nourrcier*.

*Block* fails to cure at least the aforementioned deficiencies of *Arvanitakis*, *Ramaswami*, *Phillips*, and *Nourrcier*. *Block* generally discloses a “high speed optical fiber link card communication module ... which provides a parallel electrical interface to the user.” *Block*, Col. 3: ll. 53-57. *Block* further discloses that the invention requires that “a plurality of internal power and ground planes be provided which inherently provide electrical isolation between the components mounted to the top and bottom surfaces of the card.” *Id.* at Col. 10: ll. 63-68. Nowhere, however, does *Nakanishi* disclose or suggest “a transmitter portion arranged on a contiguous bottom layer of a multi-layer printed circuit board, the transmitter portion capable of providing signals to a transmitter optical subassembly configured to transmit optical signals from the transceiver system; [and] a receiver portion arranged on the contiguous bottom layer of the

multi-layer printed circuit board, the receiver portion capable of receiving signals from a receiver optical subassembly configured to receive optical signals into the transceiver system,” as recited in claim 1. Accordingly, *Block* fails to cure the deficiencies of *Arvanitakis*, *Ramaswami*, *Phillips*, and *Nourrcier*.

Finally, *Chou* fails to cure at least the aforementioned deficiencies of *Arvanitakis*, *Ramaswami*, *Phillips*, *Nourrcier*, and *Block*. *Chou* generally discloses the use of “a plurality of ceramic substrates ... to manufacture and integrate a highly integrated multi-layer circuit module.” *Chou*, Abstract. *Chou* further discloses that its multi-layer circuit module may include “active devices, basic passive devices, high frequency passive devices, and shielding ground planes.” *Id.* at paragraph [0010]. Nowhere, however, does *Chou* disclose or suggest “a transmitter portion arranged on a contiguous bottom layer of a multi-layer printed circuit board, the transmitter portion capable of providing signals to a transmitter optical subassembly configured to transmit optical signals from the transceiver system; [and] a receiver portion arranged on the contiguous bottom layer of the multi-layer printed circuit board, the receiver portion capable of receiving signals from a receiver optical subassembly configured to receive optical signals into the transceiver system,” as recited in claim 1. Accordingly, *Chou* fails to cure the deficiencies of *Arvanitakis*, *Ramaswami*, *Phillips*, *Nourrcier*, and *Block*.

For at least the above reasons, the cited references do not render obvious amended claim 1. Therefore, Applicants respectfully submit that amended claim 1 is allowable. Amended claims 7, 8, and 14, although different in scope, recite elements similar to those recited in amended claim 1, and are allowable for at least the same reasons as claim 1. Claims 3-6, and 11-13 depend from one of claims 1 or 8 and are therefore allowable for at least the same reasons as

the claim from which they depend. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 1, 3-8, and 11-14 under 35 U.S.C. §103(a).

Claims 2 and 10

Claims 2 and 10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Arvanitakis* in view of *Ramaswami*, *Nourrcier*, *Nakanishi*, *Block*, and *Chou* in further view of *Nelson*. Claims 2 and 10 depend from one of claims 1 or 8 and therefore incorporate all of the elements recited in the claim from which they depend. As discussed above with respect to the Examiner's rejection of claims 1 and 8, *Arvanitakis*, *Ramaswami*, *Nourrcier*, *Nakanishi*, *Block*, and *Chou*, whether viewed separately or in combination, disclose or suggest "a transmitter portion arranged on a contiguous bottom layer of a multi-layer printed circuit board, the transmitter portion capable of providing signals to a transmitter optical subassembly configured to transmit optical signals from the transceiver system; [and] a receiver portion arranged on the contiguous bottom layer of the multi-layer printed circuit board, the receiver portion capable of receiving signals from a receiver optical subassembly configured to receive optical signals into the transceiver system," as recited in amended claim 1 and similarly recited in amended claim 8 and required by claims 2 and 10.

Applicants respectfully submit that *Nelson* fails to cure at least the aforementioned deficiencies of *Arvanitakis* in view of *Ramaswami*, *Nourrcier*, *Nakanishi*, *Block*, and *Chou*. *Nelson* generally discloses "[a]n interconnect device for electronic components ... [having] at least three layers of circuitry, one for signal transmission and two for voltage planes (power and ground)." *Nelson*, Abstract. As noted by the Examiner, *Nelson* further discloses that "both the power plane (and the ground plane, if desired) can be split into several electrically isolated segments to deliver different power and reference voltages." *Nelson*, Col. 12: ll. 26-31.

*Emphasis added.* Nowhere, however, does *Nelson* disclose, or even suggest, “a transmitter portion arranged on a contiguous bottom layer of a multi-layer printed circuit board, the transmitter portion capable of providing signals to a transmitter optical subassembly configured to transmit optical signals from the transceiver system; [and] a receiver portion arranged on the contiguous bottom layer of the multi-layer printed circuit board, the receiver portion capable of receiving signals from a receiver optical subassembly configured to receive optical signals into the transceiver system,” as recited in amended claim 1 and similarly recited in amended claim 8 and required by claims 2 and 10. Accordingly, *Nelson* fails to cure the deficiencies of *Ramaswami*, *Nourrcier*, *Nakanishi*, *Block*, and *Chou*.

For at least the above reasons, Applicants submit that claims 2 and 10 are allowable. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claims 2 and 10 under 35 U.S.C. §103(a).

### **Conclusion**

In view of the foregoing amendments and remarks, Applicants submit that claims, as amended, are neither anticipated nor rendered obvious in view of the references cited against this application. Applicants therefore request reconsideration and reexamination of this application and the timely allowance of the pending claims.




Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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